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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/890,929	08/07/2001	Yasuyuki Nozaki	033808/027 8	1895

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EXAMINER

CLOW, LORI A

ART UNIT	PAPER NUMBER
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1631

DATE MAILED: 07/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/890,929

Applicant(s)

NOZAKI ET AL.

Examiner

Lori A. Clow, Ph.D.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.

- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

Claims 4, 7, 10, 11, 12, and 13 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claims have not been further treated on the merits.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-7 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 1-7 recite a method for displaying a dendrogram comprising clustering data, selecting subtrees, and displaying results. The method for displaying a dendrogram by clustering data, selecting subtrees, and displaying results, is only a manipulation of data that has already been acquired. In such a case where data are merely stored as to be read or outputted by a computer without creating any functional interrelationship, either as part of the stored data or as part of the computing process performed by the computer, then such descriptive material alone does not impart functionality either to the data as so structured, or to the computer. Such descriptive material is not a process, machine, manufacture, or composition of matter (MPEP 2106, IV, 1(b)).

Furthermore, not all processes are statutory under 35 USC 101, as put forth in *Schrader*, 22 F.3d at 296, 30 USPQ2d at 1460. To be statutory, a claimed computer-related process must

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either: (A) result in a physical transformation outside the computer for which a practical application in the technical arts is either disclosed in the specification or would have been known to the skilled artisan or (B) be limited to a practical application within the technological arts.

In the instant case, the nonfunctional descriptive material may be claimed in combination with other functional descriptive multi-media material on a computer-readable medium to provide the necessary functional and structural interrelationship to satisfy the requirements of 35 USC 101.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any

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evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eisen et al. (PNAS (1998) Vol. 95, pages 14863-14868; PTO 1449 Reference) in view of Swayne et al. (Journal of Computational and Graphical Statistics (1998) Vol. 7, No. 1, pages 1-19).

Eisen et al. teach a system of cluster analysis for genome-wide expression data, the output of which is graphically displayed. The method was done by pair wise average-linkage cluster analysis, however, Eisen et al. state that there are various methods of clustering that could be employed (page 14867, column 2, lines 8-10). The method is in the form of hierarchical clustering in which objects (genes) are represented by a tree whose branch lengths reflect degree of similarity between the objects, as assessed by pair wise similarity function (page 14863, column 2, lines 36-43). The object of the algorithm is to compute a dendrogram that assembles all elements into a single tree (page 14864, column 1, lines 61-66). A central feature of the method is to provide images for viewing so that one may identify patterns of interest and readily zoom in on the detailed expression patterns and identify the genes that contribute to the expression patterns (page 14864, column 2, lines 51-54). Samples in all cases were taken from RNA that was reversed transcribed into cDNA spotted on DNA microarrays (page 14864, column 1, lines 1-21).

Eisen et al. teach a system for cluster analysis that consists of generating dendrogram in order to assess the vast array of data. Eisen et al. do not teach the visualization system that allows one to manipulate that data, however, Swayne et al. do.

Swayne et al. teach a data visualization system with interactive and dynamic methods for the manipulation of views of data, known as XGobi (page 1, lines 1-2). This system, for example, has been used to link dendrograms to parallel coordinate plots using a subset of Stanford Arabidopsis gene expression data (see XGobi website, AT&T Labs). The view menu pull down allows users several options for interactive graphics such that one can scale, edit, move points, etc. (page 3, lines 8-18). The unifying feature of these operations is that they take over the display area and dictate the mouse operations for directly manipulating the view. The Tools menu gives access to window clones, as well as data smoothing, sub-sampling, parallel display, list of cases (rows, records) (pages 3, lines 26-28; page 4, lines 1-7), meeting the limitations of subtrees and separate windows. Each variable of data can be represented in one labeled box (variable widget) which provides information about the magnitude and direction of that contribution, meeting the limitation of keywords and icon display. Users can select arbitrary variable subspaces by clicking variable widgets; they can pause, backtrack, control speed, do scans of local neighborhoods, alternate touring with exploratory projection pursuit, manually drag any variable into or out of the projection by dragging the mouse in the display area, freeze variables so that their contributions to the projection stay fixed during the tour, and link tours running in different XGobi windows (page 6, lines 29-37; page 7, lines 1-2).

It would have been prima facie obvious to one of skill in the art at the time the invention was made to use the clustering method of Eisen for large scale cluster analysis of biopolymer

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data and display it using the well known XGobi software system so that it could be manipulated such that all useful information may be extracted. In fact, as stated on the XGobi website, XGobi has been used for these types of analyses.

Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 99/09218 (Affymetrix, Inc.; PTO 1449 Reference) in view of US 5,895,474 (Maarek et al.; PTO 1449 Reference).

WO 99/09218 teaches a system and method for detecting differences in sample polymers by clustering the hybridization information (see abstract). The sets of hybridization information are clustered preferably by arrangement into hierarchical clusters where each cluster includes clusters that are more similar to each other than other clusters (page 10, line 10-14), meeting the limitation of dendrogram display of clustered data and use in gene expression data (see also figures 10-12).

WO 99/09218 does not teach the visual display parameters as set forth in the instant application, however 5,895,474 does teach an interactive, tree structured, graphical visualization aid that enables the user to better understand and interpret underlying structures in collections of digitally stored data (see abstract). The visualization device has a display device that displays a representation of the dendrogram in the form of a tree diagram having a plurality of nodes. In the tree diagram at least one of the nodes of the tree can be selectively displayed in at least two modes, including a first mode in which all of the branches of the tree depending from the node are displayed as such and a second mode in which all the information elements to which branches depending from the node lead are indicated as a single list (column 2, lines 19-32). A

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user is enabled to "collapse" clusters, such that the dendrogram can be cut at specific internal nodes to obtain a list of all members of that cluster (column 2, lines 48-50; column 6, lines 22-32). In one embodiment, the dendrogram is laid out as a tree in which each node is pictured as a square representing a cluster. The tree layout can thus be manipulated interactively as the user can move squares (column 2, lines 56-64). The arrangement enables the user to interact with the dendrogram and to modify its shape for better visualization and obtain interactively additional information. The computer workstation includes graphical user interface arranged to resemble a single desktop and execution of an application program involves one or more user interface objects represented by windows and icons. Typically there may be several windows and icons simultaneously present on the desktop and displaying information that is generated by different applications (column 3, lines 46-53).

It would have been prima facie obvious to one of skill in the art at the time the invention was made to have taken the method of WO 99/09218 for clustering polymer data and visualize that data using the system of US 5,895,474 for display purposes. As stated by US 5,895,474, this system can be used for a myriad of data types (column 4, lines 53-55).

No Claims are allowed.

Inquiries

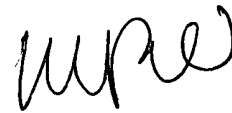
Papers related to this application may be submitted to Technical Center 1600 by facsimile transmission. Papers should be faxed to Technical Center 1600 via the PTO Fax Center located in Crystal Mall 1. The faxing of such papers must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993) (See 37 CFR § 1.6(d)). The CM1 Fax Center number is either (703) 308-4242, or (703) 308-4028.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lori A. Clow, Ph.D., whose telephone number is (703) 306-5439. The examiner can normally be reached on Monday-Friday from 10am to 6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael P. Woodward, Ph.D., can be reached on (703) 308-4028.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Legal Instrument Examiner, Tina Plunkett, whose telephone number is (703) 305-3524, or to the Technical Center receptionist whose telephone number is (703) 308-0196.



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June 30, 2003

Lori A. Clow, Ph.D.
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